

Application No.: 10/537,868

Case No: OKUDP0116US

PATENT

CERTIFICATE OF MAILING OR ELECTRONIC TRANSMISSION UNDER 37 CFR 1.8(a)

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/Mark D. Saralino/
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July 9, 2007
Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Yoshiaki HASEGAWA et al.

Application No.: 10/537,868

Filing Date: June 7, 2005

For: SEMICONDUCTOR LIGHT-EMITTING ELEMENT AND METHOD FOR
FABRICATING THE SAME

Examiner: John C. Ingham

Art Unit: 2814

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PRE-APPEAL BRIEF REQUEST FOR PANEL REVIEW

Sir:

This Pre-Appeal Brief Request for Panel Review is being filed together with a Notice of Appeal.

REMARKS

Claims 1, 4-14 and 16-19 are pending in the application.

I. TEACHINGS OF REFERENCES MUTUALLY EXCLUSIVE

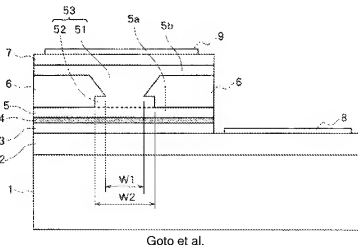
Independent claims 1 and 12 each relate to a semiconductor light-emitting element in which the current confining layer has two overhanging portions that overhang toward the striped opening. A gap is provided between each of the two overhanging portions of the current containing layer and a part of the surface of a first Group III-V compound semiconductor. In accordance with the present invention, the gap is not filled by the third Group III-V compound semiconductor.

The Examiner relies on *Goto et al.* as teaching a semiconductor light-emitting element as claimed, with the exception that the gap is unfilled by the third group III-V compound semiconductor. In order to make up for the deficiencies in *Goto et al.*, the Examiner relies on *Sirbu et al.* as teaching the desirability of air gaps in order to restrict current flow. The issue thus becomes whether it would have been obvious to combine the teachings of *Goto et al.* with the teachings of *Sirbu et al.* so as to result in the claimed invention. Applicants respectfully submit it would not.

Goto et al.:

Referring, for example, to Fig. 6 of *Goto et al.* (reproduced herein), a lower stripe portion 52 fills a gap formed by distal ends of the current blocking layer 6. As is illustrated in Figs. 8(a)-8(d) of *Goto et al.*, the lower stripe portion 52 is formed when a

FIG. 6

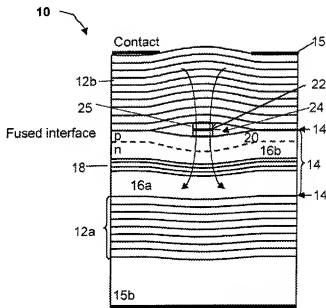


mask 15 (Fig. 8(b)) is chemically removed, and a dual stripe portion 53 is formed by growing a p-type AlGaIn layer on the second cladding layer 56a. (Col. 9, Ins. 7-27). Growth of the AlGaIn layer occurs so as to fill the gaps formed by the distal ends of the current blocking layer 6, thereby forming an upper stripe portion 51 and lower stripe portion 52.

Goto et al. teaches the desirability of *filling* of the gap with the lower stripe portion 52. Specifically, *Goto et al.* describes how the width of the lower stripe portion 52 is larger than that of the upper stripe portion 51 in order to achieve the desired properties. (See, e.g., Col. 9, ln. 60 - Col. 10, ln. 21).

Sirbu et al.:

Sirbu et al., on the other hand, teaches forming air gaps 24 in a laser device. *Sirbu et al.* teaches forming the air gaps 24 by fusing the DBR layer to the active cavity material with a mesa 22 located therebetween and applying pressure at elevated temperature. By virtue of such process, the mesa 22 is sandwiched between the DBR layer and the active cavity material so as to form the air gaps 24 on the sides of the mesa 22.



Sirbu et al. Fig. 1A.

Consequently, *Goto et al.* teaches a device which relies on the removal of a mask 15 in order that a *void can be filled* with a p-type AlGaIn layer to form a dual stripe portion 53. This produces a lower stripe portion 52 that is wider than the upper stripe

portion 51. Conversely, *Sirbu et al.* teaches providing a mesa 22 between the DBR layer and the active cavity material so as to maintain an air gap 24.

Thus, the teachings of *Goto et al.* and *Sirbu et al.* are mutually exclusive. *Goto et al.* creates a *temporary* void specifically in order that the void may be filled. *Sirbu et al.* creates a permanent void by sandwiching a mesa between the DBR layer and the active cavity material such that the void is not filled.

Furthermore, applicants argued in their previous response how there is absolutely no teaching or suggestion in either of the references as to how the teachings of *Goto et al.* may be modified to use a mesa as taught in *Sirbu et al.* (See, e.g., Apps'. Resp. filed 6/7/07, pp. 8-9). There is no teaching or suggestion as to how the fabrication process in *Goto et al.* may be modified to include some type of mesa as taught in *Sirbu et al.* yet retain the features of *Goto et al.* for forming a dual stripe portion.

II. MUST HAVE BEEN OBVIOUSNESS TO COMBINE

The Advisory Action mailed June 22, 2007 indicates that applicants' arguments had been considered but were not deemed to be persuasive. The Examiner argues that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. Rather, the Examiner argues that the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.

Frankly, applicants agree with the Examiner that the test for obviousness is *not* whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. The test is whether one of ordinary skill in the art would have found it obvious to combine the teachings of the references as claimed. As stated above, however, the objectives of the references are mutually exclusive, and in such manner the references actually teach away from the proposed combination.

Furthermore, it must have been obvious to one having ordinary skill in the art how to combine the teachings of the references as proposed. Just because a simple physical combination may or may not be possible is not dispositive of the issue whether the invention would have been obvious. As applicants previously argued, *Goto et al.* and *Sirbu et al.* utilize two very different approaches for creating a light-emitting device. There is no teaching or suggestion as to how one having ordinary skill in the art could utilize principles consistent with those taught in *Goto et al.* and *Sirbu et al.* and still achieve both the air gaps in *Goto et al.* and the air gaps in *Sirbu et al.* Specifically, there is no teaching or suggestion as to how the fabrication process in *Goto et al.* may be modified to include some type of mesa as taught in *Sirbu et al.* yet retain the features of *Goto et al.* for forming a dual stripe portion.

For at least these reasons, applicants respectfully request withdrawal of the rejection.

Should the Examiner feel that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below.

Should a petition for an extension of time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988.

Respectfully submitted,
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DATE: July 9, 2007

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